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EXAMINER

ARANCIBIA, MAUREEN GRAMAGLIA

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 01/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/646,458

Applicant(s)

COLLINS ET AL.

Examiner

Maureen G. Arancibia

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-81 is/are pending in the application.
- 4a) Of the above claim(s) 36,37,51-62 and 64-74 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35,38-50,63 and 75-81 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |                                                                                                                                                      |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                          | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                                 | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/03, 11/04, 1/04</u> | 6) <input checked="" type="checkbox"/> Other: <u>IDS 5/04, 3/05, 5/05, 11/05</u>        |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Species XLI, the embodiment of Figure 85 in the reply filed on 21 October 2005 is acknowledged. Applicant's argument that Figure 85 explicitly incorporates Figure 87 is persuasive.

2. Applicant identified Claims 1-35, 38-50, 63, and 75-81 as being drawn to the elected species.

3. Claims 36, 37, 51-62, and 64-74 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 21 October 2005.

### ***Claim Objections***

4. **Claim 43 is objected to because of the following informalities:** Claim 43 recites that the offset frequencies are centered around 10 MHz. Based on a review of the Specification (Page 106), it appears that the claim should rather recite 13.56 MHz. For the purposes of the following examination on the merits, the claim has been interpreted with this correction in mind. Appropriate correction and/or clarification is required.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**6. Claims 34 and 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claim 34 recites the limitation "said first and second RF power sources" in Line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 35 recites the limitation "said ports" in Line 1. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

**7.** The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**8. Claims 1-5, 12-25, 32, 33, 38, 39, and 63 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,432,260 to Mahoney et al.**

In regards to Claims 1, 2, and 12-25, Mahoney et al. teaches a plasma reactor (Figure 1), comprising: an enclosure 2 comprising a side wall and a ceiling and defining a chamber (Figure 1); a workpiece support pedestal 17 within the chamber having a workpiece support surface facing said ceiling and defining a process region extending generally across said wafer support pedestal and confined laterally by said side wall and axially between said workpiece support pedestal and said ceiling; said enclosure

having a first pair of openings at generally opposite sides of said process region (Figure 1); a first hollow conduit 1 outside of said chamber having first and second ends connected to respective ones of said first pair of openings, so as to provide a first reentrant path extending through said conduit and across said process region; a gas distribution apparatus 16 on a side wall of the reactor connected to gas supply 15 for introducing a process gas; and a first RF plasma source power applicator 10 for generating a plasma in the chamber.

It has been held that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)

In this case, the plasma reactor taught by Mahoney et al. includes all of the structural limitations of Claims 1, 2, and 12-25, and would be capable of performing plasma immersion ion implantation, based on the process settings. The gas distribution apparatus taught by Mahoney et al. would be inherently capable of introducing any supplied mixture of process gases containing species to be ion implanted into a layer of the workpiece. The particular type of gas used is a process limitation rather than an apparatus limitation, and the recitation of a particular type of gas does not limit an apparatus claim, see *In re Casey*, 152 USPQ 235; *In re Rishoi*, 94 USPQ 71; *In re Young*, 25 USPQ 69; *In re Dulberg*, 129 USPQ 348; *Ex parte Thibault*, 64 USPQ 666; and *Ex parte Masham*, 2 USPQ2d 1647. Also note that the inclusion of material or

article worked upon by a structure being claimed does not impart patentability to the claims. *In re Young*, 75 F.2d 966, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

In regards to Claim 3, the reactor comprises a pumping annular volume 6 defined between said workpiece support pedestal 17 and said side wall (Figure 1), and a vacuum pump coupled to said pumping annular volume. (Column 6, Lines 19-21)

In regards to Claim 4, the first RF source power applicator 10 is positioned to couple RF plasma source power into a region of said first hollow conduit 1. (Figure 1)

In regards to Claim 5, the plasma comprises a plasma current 13 in said reentrant path that oscillates at an RF frequency of said first RF plasma source power applicator. (Column 6, Lines 31-36)

In regards to Claim 32, Mahoney et al. teaches gas distribution ring 16 on the side wall of the reactor.

In regards to Claim 33, Mahoney et al. teaches that the enclosure comprises a base (Figure 1), and that the gas distribution apparatus comprises a plurality of discrete diffusers (orifices on gas ring 16; Figure 1) on the sidewall of the chamber.

In regards to Claims 38 and 39, Mahoney et al. teaches that an RF bias power generator can be coupled to said workpiece support. (Column 6, Lines 46-47)

The RF bias coupled to the workpiece support pedestal taught by Mahoney et al. would inherently be capable of controlling a sheath voltage across a plasma sheath overlying the workpiece support pedestal, depending on the other process settings of the plasma reactor. This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

In regards to Claim 63, Mahoney et al. teaches an RF source power generator 11 coupled to said first RF power applicator and an RF bias power generator coupled to said workpiece support pedestal 17. (Column 6, Lines 46-47)

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mahoney et al. in view of U.S. Patent 6,150,628 to Smith et al. (from Applicant's IDS).**

The teachings of Mahoney et al. were discussed above.

In regards to Claim 6, Mahoney et al. teaches that the first hollow conduit comprises a metal material. (Column 6, Lines 15-16)

Mahoney et al. does not expressly teach an annular insulating gap in the first hollow conduit separating the hollow conduit into axial sections.

Smith et al. teaches an annular insulating gap 116 in a metallic hollow conduit 100 separating the hollow conduit into axial sections. (Figure 3)

It would have been obvious to one of ordinary skill in the art to modify the hollow conduit taught by Mahoney et al. to comprise an annular insulating gap, as taught by Smith et al. The motivation for making such a modification, as taught by Smith et al. (Column 8, Lines 3-27), would have been to prevent induced current flow from forming in the wall of the hollow conduit (*the plasma chamber itself*).

**11. Claims 7-11, 40-42, and 75-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahoney et al. in view of U.S. Patent 5,571,366 to Ishii et al.**

The teachings of Mahoney et al. were discussed above.

In regards to Claims 7 and 8, Mahoney et al. does not expressly teach the claimed features of the reactor.

Ishii et al. teaches that the gap between the ceiling of a chamber and a wafer support pedestal 4 can be adjustable by use of pedestal elevating mechanism 78. (Figure 14)

It would have been obvious to one of ordinary skill in the art to modify the reactor taught by Mahoney et al. to have the gap between the ceiling of a chamber and a wafer support pedestal be adjustable, as taught by Ishii et al. The motivation for making such a modification, as taught by Ishii et al. (Column 11, Lines 61-67), would have been to



allow the surface to be processed to be moved to a space having an optimum plasma density distribution.

In the apparatus taught by the combination of Mahoney et al. and Ishii et al., the ceiling would be inherently capable of comprising a constriction of the reentrant torroidal path in the process zone for enhancement of plasma ion density, and the gap between the ceiling and the pedestal would be inherently capable of being sufficiently small so that the plasma ion density of the plasma current would be greater in the vicinity of the pedestal than elsewhere along the reentrant path, simply by adjusting the gap to be smaller. This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

In regards to Claim 9, Mahoney et al. does not expressly teach that the workpiece support pedestal can comprise an electrostatic chuck with a thermal control apparatus for workpiece thermal control.

Ishii et al. teaches that a workpiece support pedestal 4 comprises an electrostatic chuck 12 with a thermal control apparatus 9 for workpiece thermal control. (Figure 1)

It would have been obvious to one of ordinary skill in the art to modify the workpiece support pedestal taught by Mahoney et al. to comprise an electrostatic chuck and a thermal control apparatus, as taught by Ishii et al. The motivation for including an electrostatic chuck, as taught by Ishii et al. (Column 5, Lines 39-42), would have been to allow the wafer to be held in place by a Coulomb force. The motivation for including a

thermal control apparatus, as taught by Ishii et al. (Column 5, Lines 19-30), would have been to allow the target surface of the wafer to be processed to be cooled to a desired temperature.

In regards to Claims 10 and 11, Mahoney et al. teaches that an RF bias power generator can be coupled to said workpiece support. (Column 6, Lines 46-47)

In regards to Claims 40-42 and 75-81, Mahoney et al. does not expressly teach the RF bias power frequency.

Ishii et al. teaches a inductively coupled plasma apparatus (Figure 1), comprising an RF bias generator 19 having an RF bias frequency of about 2 MHz coupled to a workpiece support pedestal 4. (Column 5, Line 56 - Column 6, Line 16)

It would have been obvious to one of ordinary skill in the art to modify the reactor taught by Mahoney et al. to have an RF bias frequency of about 2 MHz coupled to the workpiece support pedestal. The motivation for including an RF bias generator with a frequency of about 2 MHz coupled to the workpiece support pedestal, as taught by Ishii et al. (Column 5, Lines 57-62), would have been to effectively emit the flow of the plasma onto the target surface of the workpiece.

The RF bias with a frequency of about 2 MHz coupled to the workpiece support pedestal taught by the combination of Mahoney et al. and Ishii et al. would inherently be capable of meeting the limitations of Claims 40-42 and 75-77, depending on the other process settings of the plasma reactor. Moreover, the frequency of about 2 MHz meets the limitations recited in Claims 78-81. This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended

by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

**12. Claims 26-30, 34, 35, 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahoney et al. in view of U.S. Patent 6,392,351 to Shun'ko (from Applicant's IDS).**

The teachings of Mahoney et al. were discussed above.

In regards to Claim 26, Mahoney et al. teaches that the reactor can instead comprise a first and second pair of openings through the enclosure displaced from one another; first and second hollow conduits 1a, 1b outside of the chamber each having first and second ends connected to respective ones of each pair of openings; and first and second plasma source power applicators 10a, 10b coupled to each hollow conduit for generating plasma currents 13a, 13b in the respective reentrant paths. (Figure 2)

Mahoney et al. does not teach that the first and second hollow conduits can both have openings at opposite sides of the process region, or that the second reentrant path can be transverse to the first reentrant path.

Shun'ko teaches a first hollow conduit 90<sub>3</sub> and a second hollow conduit 90<sub>4</sub> both having openings at opposite sides of a process region ("top" vs. "bottom" and "left" vs. "right" when seen from above; Figure 4), with the second reentrant path transverse to the first reentrant path. (Figure 4)

It would have been obvious to one of ordinary skill in the art to modify the positioning of the first and second hollow conduits in the reactor of Mahoney et al. as

taught by Shun'ko. The motivation for making such a modification, as taught by Shun'ko (Column 4, Lines 51-64), would have been to optimize plasma distribution.

In regards to Claim 27, Mahoney et al. teaches first and second RF power sources 11a, 11b for furnishing RF power to the first and second RF power applicators 10a, 10b. (Figure 2)

In regards to Claims 28 and 43, Mahoney et al. teaches variable RF power sources. (Column 10, Lines 47-52) The power sources would be inherently capable of supplying RF powers with the claimed relationship, simply by adjusting the sources. This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

In regards to Claims 29 and 30, the first and second paths taught by the combination of Mahoney et al. and Shun'ko are orthogonal to one another. It is the Examiner's assertion that the paths would intersect one another in the process region due to diffusion of the plasma. This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

In regards to Claim 34, the first and second RF power applicators 10a, 10b taught by Mahoney et al. are conductors coiled around the respective hollow conduits (Column 6, Lines 29-31), and are each coupled to respective RF power sources.

In regards to Claim 35, the hollow conduits 1a, 1b taught by Mahoney et al. terminate axially into the openings in the ceiling of the reactor. (Figure 2)

In regards to Claim 44, the hollow conduits taught by the combination of Mahoney et al. and Shun'ko are non-intersecting in that the paths only intersect one another in the process region.

**13. Claims 31 and 45-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahoney et al. in view of U.S. Patent 5,958,140 to Arami et al.**

The teachings of Mahoney et al. were discussed above.

In regards to Claims 31, 45, and 46, Mahoney et al. does not expressly teach that the gas distribution apparatus comprises a gas distribution plate on the ceiling of the reactor, or that it comprises a gas panel containing separate gas supplies, a center set of orifices, an outer set of orifices, and a gas distribution controller comprising a first set of valves coupling at least one gas supply to the center orifices, and a second set of valves coupling some gas supplies to the outer orifices.

Arami et al. teaches a gas distribution apparatus comprising a gas distribution plate 35 on the ceiling of reactor 21 (Figure 2), comprising a gas panel containing separate gas supplies 41, 42, 43; a center set of orifices 48 connected to gas chamber 37A, an outer set of orifices 48 connected to gas chamber 37C, and a gas distribution controller comprising a first set of valves 44A coupling at least one gas supply to the center orifices, and a second set of valves 44C coupling some gas supplies to the outer orifices. (Figure 2)

It would have been obvious to one of ordinary skill in the art to modify the reactor taught by Mahoney et al. to use the gas distribution apparatus of Arami et al. The motivation for making such a modification, as taught by Arami et al. (Column 6, Lines 27-33), would have been to improve uniformity of processing by having the gas supply amount per unit area be set equal to the gas consumption in each area.

In regards to Claims 45-50, the particular type of gas used is a process limitation rather than an apparatus limitation, and the recitation of a particular type of gas does not limit an apparatus claim, see *In re Casey*, 152 USPQ 235; *In re Rishoi*, 94 USPQ 71; *In re Young*, 25 USPQ 69; *In re Dulberg*, 129 USPQ 348; *Ex parte Thibault*, 64 USPQ 666; and *Ex parte Masham*, 2 USPQ2d 1647. <sup>6</sup>This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

### ***Double Patenting***

14. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

### ***Double Patenting***

**15. Claims 1-35, 38-50, 63, and 75-81 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 7, 10-13, 26, and 27 of U.S. Patent No. 6,348,126; or alternatively over claims 1, 2, 9, 12, 15, 18, and 20 of U.S. Patent No. 6,468,388; or alternatively over claims 1-4, 7, and 8 of U.S. Patent No. 6,494,986; or alternatively over claims 1, 2, and 4 of U.S. Patent No. 6,551,446; each in view of Mahoney et al., Smith et al., Ishii et al., Shun'ko, and Arami et al.**

The respective claims of U.S. Patent Nos. 6,348,126 ('126); 6,468,388 ('388); 6,494,986 ('986); and 6,551,446 ('466) each recite at least a plasma reactor having at least at a first hollow conduit outside of a chamber with respective ends connected to openings in the chamber ceiling, as recited in instant Claim 1.

The teachings of Mahoney et al., Smith et al., Ishii et al., Shun'ko, and Arami et al. supply what each of the claims of '126, '388, '986, or '466 lack, as discussed in the rejections set forth above. It would have been obvious to one of ordinary skill in the art to respectively modify the teachings of the claims of '126, '388, '986, or '466 as taught by Mahoney et al., Smith et al., Ishii et al., Shun'ko, and Arami et al. for the reasons set forth in the rejections above. Attention is particularly pointed to Column 4, Lines 46-52

and Column 7, Lines 54-67 of Mahoney et al., wherein the advantages of employing multiple, individually powered hollow conduits are set forth.

**16. Claims 1-35, 38-50, 63, and 75-81 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 14-16 of copending Application No. 10/646,527; or alternatively over claims 1-3 of copending Application No. 10/646,533; each in view of Mahoney et al., Smith et al., Ishii et al., Shun'ko, and Arami et al.**

The respective claims of U.S. Patent Application Nos. 10/646,527 ('527) and 10/646,533 ('533) each recite at least a plasma reactor having *at least* at a first hollow conduit outside of a chamber with respective ends connected to openings in the chamber ceiling, as recited in instant Claim 1. It is noted that while the claims of '533 recite a method, they recite the structural limitations of the instant claims, and thus render them obvious.

The teachings of Mahoney et al., Smith et al., Ishii et al., Shun'ko, and Arami et al. supply what each of the claims of '527 and '533 lack, as discussed in the rejections set forth above. It would have been obvious to one of ordinary skill in the art to respectively modify the teachings of the claims of '527 and '533 as taught by Mahoney et al., Smith et al., Ishii et al., Shun'ko, and Arami et al. for the reasons set forth in the rejections above. Attention is particularly pointed to Column 4, Lines 46-52 and Column 7, Lines 54-67 of Mahoney et al., wherein the advantages of employing multiple, individually powered hollow conduits are set forth.



**This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.**

***Conclusion***

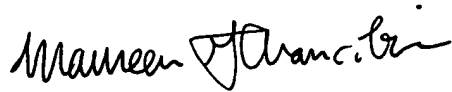
17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 5,885,358 to Maydan et al. teaches a gas distribution comprising a plurality of discrete injection nozzles 100 on a side wall of an enclosure. (Figure 3) U.S. Patent 5,897,713 to Tomioka et al. teaches that the frequencies of two RF power sources can be offset. (Abstract)

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571) 272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1763

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Maureen G. Arancibia  
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